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For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: FULL LENGTH cDNA CLONES AND PROTEINS ENCODED THEREBY

(57) Abstract: Novel human proteins and DNAs encoding the proteins are provided. Four kinds of human proteins and full length cDNAs encoding these proteins have been isolated. The full length cDNAs of the present invention have been isolated from a cDNA library derived from progenitor cells and are used to produce these proteins.



WO 01/07607 A3

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference H1-108PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/JP 00/ 04895	International filing date (day/month/year) 21/07/2000	(Earliest) Priority Date (day/month/year) 23/07/1999
Applicant HELIX RESEARCH INSTITUTE et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☒ contained in the international application in written form.

☒ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☒ None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP 00/04895

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-16, partly

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-16, partly

An isolated polynucleotide comprising seq. ID 1 and/or encoding the polypeptide of seq. ID 2 or homologs thereof. Corresponding polypeptides, peptides, antibodies, probes, antisense molecules, methods of synthesis and methods of detection.

2. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 3 and 4.

3. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 5 and 6.

4. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 7 and 8.

REASON OF LACK OF UNITY:

Prior art teaches that the expression of several proteins is induced in NT2 cells stimulated with retinoic acid (Sheridan, J. Mol. Neurosci. 10:121-128, 1998). Moreover, a method to prepare the library with capped oligos and a method analyze the fullness of the genes with the ATGpr system have been described in prior art (W09920750).

In the light of prior art, the problem addressed in the present application can be defined as the provision of further human genes induced in NT2 cells upon treatment with retinoic acid. The solutions proposed are four allegedly novel genes characterized by the nucleic acid sequences of seq. ID 1,2,3 and 4, respectively.

Whereas,

Genes induced in NT2 cells upon treatment with retinoic acid are known in prior art,

The solutions proposed are essentially different in terms of primary structure,

No further technical feature has been identified which, in the light of prior art, could have been considered as a special technical feature common to all of the solutions,

Now, therefore, the International Search Authority is of the opinion that the inventions claimed in the present application are not so linked as to form a single, general inventive concept in the sense of Rule 13

PCT.

In consequence, the application lacks unity of invention. Those inventions which could not be linked by a common inventive concept are listed hereabove as separate subjects pursuant to Art. 17(3)(a) PCT.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-16, partly

An isolated polynucleotide comprising seq. ID 1 and/or encoding the polypeptide of seq. ID 2 or homologs thereof.

Corresponding polypeptides, peptides, antibodies, probes, antisense molecules, methods of synthesis and methods of detection.

2. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 3 and 4.

3. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 5 and 6.

4. Claims: 1-16, partly

Idem as subject matter 1, but limited to seq. IDs 7 and 8.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/04895

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C12N 1 C12N5/10 C07K14/47 C07K16/18
C12Q18/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EMBL, BIOSIS, EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL SEQUENCES [Online] Accession No. AA631935, 31 October 1997 (1997-10-31) CHEN X. ET AL.: "fmfc2 regional genomic DNA specific cDNA library, H. sapiens cDNA clone CR18-9." XP002150622 compare nt 1-501 with nt 600-1100 of seq. ID 1 (>90% identity).	1-13,15, 16
Y	---	14
Y	WO 99 20750 A (SALAMOV ASAF ;HELIX RESEARCH INST (JP); ISOGAI TAKAO (JP); OTA TOS) 29 April 1999 (1999-04-29) abstract --- -/--	14

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

20 October 2000

Date of mailing of the international search report

01.02.01

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Galli, I

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 00/04895

C.(Continuation) DOCUMENTS CONSIDERED RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>SHERIDAN K.M. & MALTESE W.A.: "Expression of Rab3a GTPase and other synaptic proteins is induced in differentiated NT2N neurons."</p> <p>J. MOL. NEUROSCIENCE, vol. 10, April 1998 (1998-04), pages 121-128, XP000952944 the whole document</p> <p>-----</p>	1-16

Information on patent family members

PCT/JP 00/04895

Form PCT/ISA/210 (patent family annex) (July 1992)